



Food and Agriculture Organization  
of the United Nations

# Land Resources Planning (LRP) Toolbox User Guide

2019



## Land Resources Planning (LRP) Toolbox User's Guide

The LRP Toolbox is a freely accessible online source for a range of stakeholders, directly or indirectly involved in land use planning (planners, policy makers, governments, institutions, communities, technical specialists, etc.). The Toolbox contains summaries and links for a comprehensive number of land resource planning tools and approaches developed by FAO and other institutions. The overall goal of the Toolbox is to make potential users aware of the existence of these tools, facilitate access to their information, and assist with the selection of those tools that meet the requirements of different stakeholders, operating at different levels, regions, and sectors.

To complete and improve this endeavour, the Land and Water Division globally implemented a survey on “Review and evaluation of participatory land use/ resource planning tools” with around 750 different stakeholders submitting their experiences. Through this process, opportunities and gaps in the use of tools were identified showing the way forward for further development on land resources planning. A range of new tools proposed by survey’s participants enriched the already existing long list of tools. The outcomes of the survey and the Land Resources Planning Toolbox are reported in the Land and Water Division Working Paper 14 “[Land resources planning for sustainable land management](http://www.fao.org/3/a-i5937e.pdf)” (<http://www.fao.org/3/a-i5937e.pdf>).

This guide will walk you through the way the Toolbox works and presents the key features in order to support the selection of those tools that best meet your needs.

For any questions, please contact us at [LRP-Secretariat@fao.org](mailto:LRP-Secretariat@fao.org); [feras.ziadat@fao.org](mailto:feras.ziadat@fao.org); [theodora.fetsi@fao.org](mailto:theodora.fetsi@fao.org)

### Motivation for developing a LRP Toolbox

There is a growing recognition that due consideration must be given to the complex interactions between the human and natural environment components in order to help decision-makers at national, sub-national and local levels, in adopting long-term sustainable land resource planning and management. The classical approaches to land evaluation and land use planning are no longer considered sufficient to address the growing demands for stakeholder-responsive and sustainable land use planning. In response to this gap, new tools and approaches have been developed over the last few decades, which the LRP Toolbox aims to present and assist different stakeholders with finding the most appropriate ones.

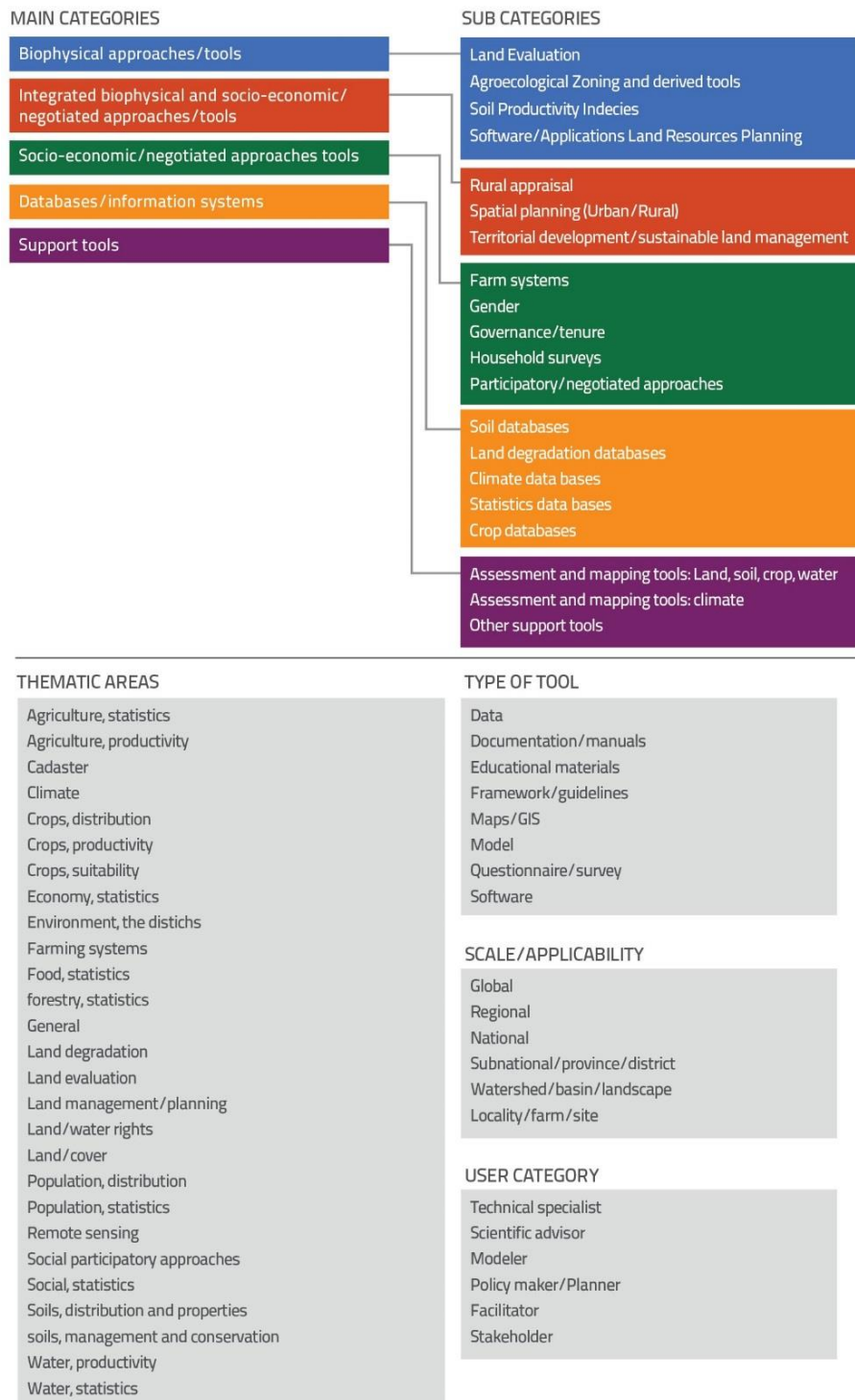
### Key features and content of the LRP Toolbox

The LRP Toolbox is intended to provide answers to the questions: what tools are available, what are their capabilities and limitations, for which stakeholders, regions and scales of planning are they suitable?

The Toolbox includes a description of each individual land resource planning tool. The tools featured in the Toolbox are grouped into five main categories that encompass different thematic domains in the land use planning process. The overall structure and content of the LRP Toolbox is presented in Figure 1.

FIGURE 1

**Structure and content of the Land Resources Planning Toolbox**



**Main categories:** the main categories in the Toolbox are (Figure 2):

- Biophysical approaches/ tools
- Socio-economic and negotiation approaches/tools
- Integrated biophysical , socio-economic and negotiation approaches/tools
- Databases/Information systems
- Support tools

FIGURE 2

**Homepage and main categories of the FAO LRP Toolbox**

The screenshot shows the FAO LRP Toolbox homepage. At the top is the FAO logo and navigation links. Below is a 'Land & Water' section with tabs for Overview, Water, Land, Databases & Software, News, Events, and Outreach. A sidebar on the left lists various land management topics. The main content area features six categories, each with a representative image and a brief description:

- Land Resources Planning Toolbox:** A freely accessible online source for stakeholders involved in land use planning, containing various tools and approaches.
- Biophysical approaches/tools:** Tools focusing on biophysical attributes like climate, soil, and terrain for land evaluation.
- Integrated biophysical, socio-economic and negotiation land resources planning approaches/tools:** Tools that integrate biophysical and socio-economic data for participatory planning.
- Socio-economic/ negotiated approaches/ tools:** Tools emphasizing social and economic settings for participatory decision-making.
- Databases/Information systems:** Tools providing data for land evaluation, such as maps, soil characteristics, and socio-economic statistics.
- Support tools:** Tools that provide supporting data for land evaluation studies and planning.

**Biophysical approaches/tools** give prominence to biophysical attributes (climate, soil, terrain, water, etc.) and their interactions in the land evaluation process (Figure 3). The output, in most cases, guides the users to suitable options for land use alternatives, based mainly on biophysical attributes. Land suitability and similarity analysis are typical examples. Documents describing principles, approaches and guidelines for land evaluation are included, as well as different tools for classifying soils based on the suitability for a specific use, capability or potential, fertility constraints and management and linkages to yield, productivity, physical and chemical properties. Sophisticated or simplified modelling of crop growth and yield predictions, also fall into this category.

FIGURE 3

### Biophysical approaches/tools

#### Land Resources Planning Toolbox

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[→ More search options](#)

#### Biophysical approaches/tools



This category of tools gives prominence to biophysical attributes (climate, soil, terrain, water, etc.) and their interactions in the land evaluation process. The output, in most cases, guides the users to suitable options for land use alternatives, based mainly on biophysical attributes. Land suitability and similarity analysis are typical examples. Documents describing principles, approaches and guidelines for land evaluation are included, as well as different tools for classifying soils based on the suitability for a specific use, capability or potential, fertility constraints and management and linkages to yield, productivity, physical and chemical properties. Sophisticated or simplified modelling of crop growth and yield predictions, also fall into this category.

Number of records: 15



**Voluntary Guidelines on Sustainable Soil Management (VGSSM)**

The Voluntary Guidelines for Sustainable Soil Management (VGSSM) were developed through an inclusive process within the framework of the Global Soil Partnership (GSP). The guidelines provide technical recommendations on how sustainable soil management can be achieved. The VGSSM are of voluntary nature and are...

**Type:** Framework/Guidelines  
**Scale:** Locality/Farm/Site, Watershed/Basin/Landscape  
**Thematic areas:** Soils - management and conservation



**Land Potential Knowledge System (LandPKS)**

The Land Potential Knowledge System (LandPKS) is a database that includes mobile phone applications and cloud computing technologies implemented by USAID in a number of pilot countries, mainly in Africa. LandPKS is designed to help offset the major challenges land resource managers face in getting access to good-quality site-specific...

**Type:** Crowdsourcing,Data  
**Scale:** Locality/Farm/Site  
**Thematic areas:** Land use/cover, Soils - distribution and properties



**Grassland Regeneration and Sustainability Standard (GRASS)**

GRASS is a standard for sustainable rangeland management developed through experiences gained in a collaborative project involving The Nature Conservancy (TNC), Ovis XXI, rangeland scientists and grazing consultants, and a network of ranchers in the Argentinian and Chilean Patagonia. Patagonia's 400 million acres of temperate...

**Type:** Documentation/Manuals  
**Scale:** Locality/Farm/Site  
**Thematic areas:** Agriculture - productivity



**Global Agro-Ecological Zones (GAEZ)**

Global Agroecological Zones (GAEZ) is both a methodology for assessing global land resources and a spatial database. The methodology has been jointly developed over the past 30 years by FAO and the International Institute for Applied Systems Analysis (IIASA) and is explained in the Model Documentation...

**Type:** Data  
**Scale:** Global, Regional, National, Sub-national/Province/District  
**Thematic areas:** Climate, Crops - suitability, Land use/cover, Soils - distribution and properties

1
2

**Socio-economic and negotiation approaches/tools** (Figure 4) cover aspects of the human environment (farming systems, tenure, aspects of participatory planning etc.). The tools in this category give prominence to the characterization of social and economic settings required for land use planning and includes approaches and methods of participatory decision-making. Biophysical conditions may be considered in these tools, but not in depth.

FIGURE 4

**Socio-economic/ negotiated tools and approaches**


### Land Resources Planning Toolbox

Q


[→ More search options](#)

**Socio-economic/ negotiated approaches/ tools**

The tools in this category give prominence to the characterization of social and economic settings required for land use planning and includes approaches and methods of participatory decision-making. Biophysical conditions may be considered in these tools, but not in depth.



Number of records: 12




Toolkit for the application of Green Negotiated Territorial Development (GreeNTD)

The GreeNTD (Green Negotiated Territorial Development) is an approach to land use planning based on a socio-ecological territorial development methodology that supports wide stakeholders engagement in seeking progressive territorial consensus through a holistic, bottom-up and negotiated vision. Its objective is to get an agreed, socially legitimate and sustainable use...

**Type:** Documentation/Manuals

**Scale:** Locality/Farm/Site, Watershed/Basin/Landscape

**Thematic areas:** Social - participatory approaches




Farming systems and poverty (FSP)

This study summarizes a joint FAO-World Bank study on the characteristics of major farming systems of the developing world and their interrelationship to poverty. On the basis of broad similarities in the patterns of production systems, farming practices and external conditions, it recognizes globally 72 farming systems...

**Type:** Documentation/Manuals,Maps/GIS

**Scale:** Global

**Thematic areas:** Farming systems




Self-evaluation and Holistic Assessment of Climate Resilience of Farmers and Pastoralists (SHARP)

The Self-evaluation and Holistic Assessment of Climate Resilience of Farmers and Pastoralists (SHARP) is a tool, available as a tablet or smartphone app, that enables smallholder farmers and pastoralists to assess their own climate resilience. The SHARP tool is implemented in three phases: (1) A participatory...

**Type:** Questionnaire/Survey

**Scale:** Locality/Farm/Site

**Thematic areas:** Climate, Farming systems



Participatory Video (PVIDEO)

Participatory video (PVIDEO) is a process in which a group or community creates their own film. PVIDEO differs from conventional documentary making in that the subjects themselves shape issues according to their own sense of what is important, and that they control how they will be represented. The idea behind...

**Type:** Educational materials

**Scale:** Locality/Farm/Site

**Thematic areas:** Social - participatory approaches

1
2

**Integrated biophysical, socio-economic and negotiation approaches/tools** make joint use of data and methods applied in both biophysical and socio-economic spheres following a participatory and negotiated approach (Figure 5). The tools in this category use as inputs information on both biophysical characteristics and social and economic conditions and generally incorporate principles, approaches and methods of participatory land use planning, with the overall objective of reaching mutually beneficial outcomes for all stakeholders.

FIGURE 5


**Integrated biophysical, socio-economic and negotiated tools and approaches**

### Land Resources Planning Toolbox

Q


[→ More search options](#)

**Integrated biophysical, socio-economic and negotiation land resources planning approaches/tools**



The tools in this category use as inputs information on both biophysical characteristics and social and economic conditions and generally incorporate principles, approaches and methods of participatory land use planning, with the overall objective of reaching mutually beneficial outcomes for all stakeholders.

Number of records: 13




**The Future of Our Land. Guidelines for Integrated Planning for Sustainable Management of Land Resources (FUTURE\_LAND)**

This document proposes a land use planning approach for sustainable management of land resources based on an interactive partnership between governments and people. The advocated approach is centered on the concept of stakeholders and their objectives, and the role of government in creating the conditions within which rural...

**Type:** Framework/Guidelines

**Scale:** National, Sub-national/Province/District, Locality/Farm/Site, Watershed/Basin/Landscape

**Thematic areas:** Land management/planning




**Mapping Climate Change Vulnerability and Impact Scenarios: a Guide-book for Sub-National Planners (MAP\_CCVIS)**

This guidebook is part of a series of publications UNDP is developing under its Territorial Approach to Climate Change (TACC) platform to provide guidance to regional governments on climate change planning. Its specific objective is to support sub-national areas ("territories") to become resilient to anticipated climate...

**Type:** Educational materials,Framework/Guidelines

**Scale:** Sub-national/Province/District

**Thematic areas:** Climate, Land management/planning




**Regional Sustainable Land and Water Management (TerrAfrica)**

The TerrAfrica partnership between FAO, the World Bank, NEPAD and other implementing agencies offers a knowledge platform for sharing lessons and developing tools and learning materials for scaling up and mainstreaming sustainable land management (SLM) into development planning and relevant sectoral and investment plans, portfolios and...

**Type:** Documentation/Manuals,Framework/Guidelines

**Scale:** National, Sub-national/Province/District, Watershed/Basin/Landscape

**Thematic areas:** Land management/planning



**Guidelines for Land Use Planning (Guide\_LUP)**

The Guidelines for Land Use Planning, published in 1993, summarize experiences gained by FAO on land use planning through numerous field projects and the consensus reached through expert consultations. In the guidelines land use planning is interpreted as the systematic assessment of physical, social and economic factors in such a...

**Type:** Framework/Guidelines

**Scale:** National, Sub-national/Province/District, Locality/Farm/Site, Watershed/Basin/Landscape

**Thematic areas:** Land management/planning

1
2

The category **Databases/ Information systems** includes tools that can facilitate land evaluation and land use planning by providing data and information that may serve as inputs for the process (Figure 6). These databases provide maps and data on soil and terrain characteristics, land degradation, land cover, land use, climatic data including future projections, crops and yields, food, agriculture, water resources, adaptability/suitability of identified plant species for a given environment, and socio-economic data and statistics on poverty, population, tenure and gender.

FIGURE 6  
**Databases/Information Systems**

### Land Resources Planning Toolbox

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[→ More search options](#)

#### Databases/Information systems

This category includes databases that can facilitate land evaluation and land use planning by providing information that may serve as inputs for the process. These databases provide maps and data on soil and terrain characteristics, land degradation, land cover, land use, climatic data including future projections, crops and yields, food, agriculture, water resources, adaptability/suitability of identified plant species for a given environment, and socio-economic data and statistics on poverty, population, tenure and gender.

*Number of records: 34*

**Gender and Land Rights Database (GLRD)**

The Gender and Land Rights Database (GLRD) is a FAO-developed dissemination platform to highlight the major political, legal and cultural factors that influence the realisation of women's land rights throughout the world. It provides information about gender and land issues through 84 country profiles, land tenure statistics disaggregated by...

**Type:** Data  
**Scale:** National  
**Thematic areas:** Land/water rights, Social - statistics

**Soil and Landscape Grid of Australia (SOLAGRID)**

The Soil and Landscape Grid of Australia provides access to high-resolution soil and landscape attributes. The soil attribute products consist of (1) nation-wide soil attribute maps which were generated by combining (2) Australia-wide 3D soil attribute maps with (3) regional maps for parts of Australia. The generation of...

**Type:** Maps/GIS  
**Scale:** National  
**Thematic areas:** Soils - distribution and properties, Topography

**Global Lakes and Wetlands Database (GLWD)**

The Global Lakes and Wetlands Database (GLWD) has been created on the basis of existing maps, data and information, such as the Digital Chart of the World, World Conservation Monitoring Centre (WCMC) and others. It focuses in three coordinated levels on (1) large lakes...

**Type:** Maps/GIS  
**Scale:** Global, Regional  
**Thematic areas:** Land use/cover

**USDA-NRCS Geospatial Data Gateway (USDA-NRCS)**

The Geospatial Data Gateway (GDG) of the United States Department of Agriculture- National Resources Conservation Service provides access to a map library of over 100 high-resolution vector and raster layers in the USDA Geospatial Data Warehouse. It is the one-stop source for environmental and natural resources...

**Type:** Maps/GIS  
**Scale:** National, Sub-national/Province/District, Locality/Farm/Site, Watershed/Basin/Landscape  
**Thematic areas:** Cadaster, Land use/cover, Population - distribution, Remote sensing, Soils - distribution and properties, Topography

1
2
3
4



The **support tools** do not produce results that have direct use for land evaluation and land use planning, but has a supporting role by providing various types of information that can be used in land evaluation studies and as input data sets for land use planning (Figure 7).


FIGURE 7  
Support tools

### Land Resources Planning Toolbox

Q


[→ More search options](#)

#### Support tools



This category of tools do not produce results that have direct use for land evaluation and land use planning, but has a supporting role by providing various types of data that can be used in land evaluation studies and as input data sets for land use planning.

*Number of records: 21*




**FAO-CSIC Multilingual Soil Profile Database (SDBM Plus)**

SDBM Plus is a software package designed to harmonize, store and use large amounts of geo-referenced soil profile data, elaborated in the field and the laboratory, in an efficient and systematic way. The soil profile database can be utilized regardless of scale, at regional, national or local level. The...

**Type:** Data

**Scale:** Global, Regional, National, Sub-national/Province/District, Watershed/Basin/Landscape

**Thematic areas:** Soils - distribution and properties




**WORLDPOP: High Resolution Age-structured Population Distribution Maps**

The WorldPop project provides high-resolution, open-access and contemporary data on human population distributions, allowing accurate measurement of local population distributions, compositions, characteristics, growth and dynamics, across national and regional scales. WorldPop provides high-resolution gridded estimates for population, age structure, dependency ratios at continental scale for Africa, Latin America and the...

**Type:** Maps/GIS

**Scale:** Global, Regional, National, Sub-national/Province/District

**Thematic areas:** Population - distribution




**Horticulture Cultivars Performance Database (Hortivar)**

Hortivar is FAO's database on the performances and standard descriptions of horticultural cultivars over the world. Information can be retrieved regarding six groups of crops: fruits, vegetables, root and tuber crops, herbs and condiments, ornamentals and mushrooms. Hortivar contains a standard methodology for data collection and record keeping on the...

**Type:** Crowdsourcing,Data

**Scale:** Regional, National, Sub-national/Province/District

**Thematic areas:** Agriculture - productivity



**Land Cover Classification System (LCCS)**

The Land Cover Classification System (LCCS) was developed by FAO to provide a consistent framework for the classification and mapping of land cover. Its main objectives were to overcome the rigidity of a-priori land cover classifications, which in many practical situations do not allow easy assignment into one of the...

**Type:** Data,Documentation/Manuals

**Scale:** Sub-national/Province/District, Watershed/Basin/Landscape

**Thematic areas:** Land use/cover

1
2
3

**Sub-categories:** Each main category is subdivided into sub-categories, according to the similarity in information content (Figure 1). Characteristic for the sub-categories is that they belong exclusively to one main category, but not to another. For example, the main category ‘Biophysical approaches/tools’ has sub-categories: (1) Land evaluation; (2) Agroecological zoning and derived tools; (3) Soil productivity indices; (4) Software/ applications for land resource planning, which are not shared with other main categories. The same restriction on choice of sub-categories applies to the other main categories.

**Thematic area, types of tool, scale and user category:** the tools are further characterized in terms of thematic area, type of tool, scale and applicability and user category (Figure 1). The “thematic areas” classifies the tools according to their main focus under broad classes. However, most of the tools are often covering more than one theme and are multi-disciplinary in nature; the users can identify more than one thematic area to search for appropriate tool(s). The “Type of tool” classifies the tools according the nature of the published material that the users can access and use. Some tools are published in different formats and the users could be interested in certain format of tools for the application at hand. The “scale/applicability” classification shows the different spatial scales under which the tool is expected to be most useful and relevant. This is based on the nature of the tool and, in some cases, on the original scale under which the tool was developed. The “user category” defines the target group for which each tool is suitable.

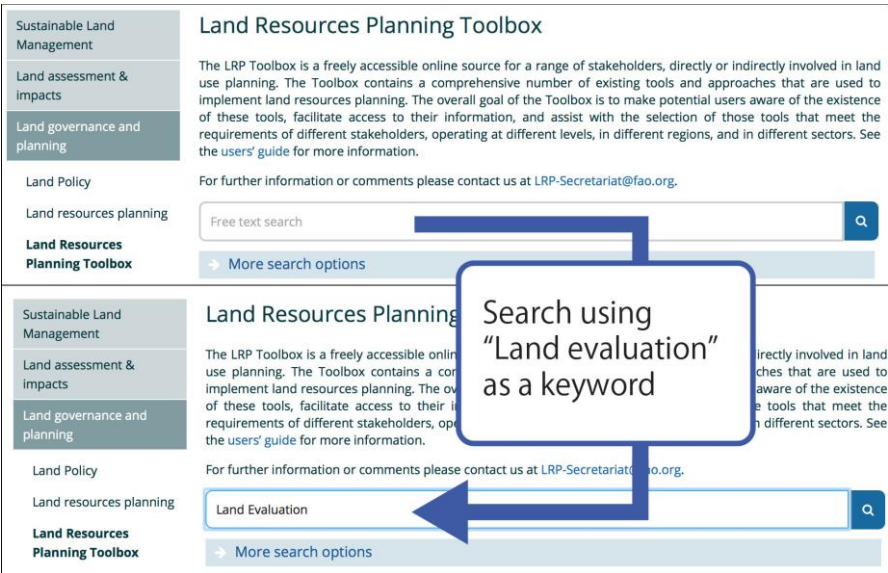
**How to use the Toolbox?**

The LRP Toolbox provide an up-to-date inventory of tools, approaches, databases and support tools available for various stakeholders working on land use planning related fields. The aim is to assist decision makers at different levels to choose and access the tool(s) that best fit their demands and capable of supporting planning needs for a specific case under consideration.

The Toolbox offers two search options to help users find the tools most relevant to their needs, the free search and the guided search. The free search engine uses keywords (for example, the tool acronym) to retrieve results of all toolbox content and is available on the Toolbox homepage (Figure 8).

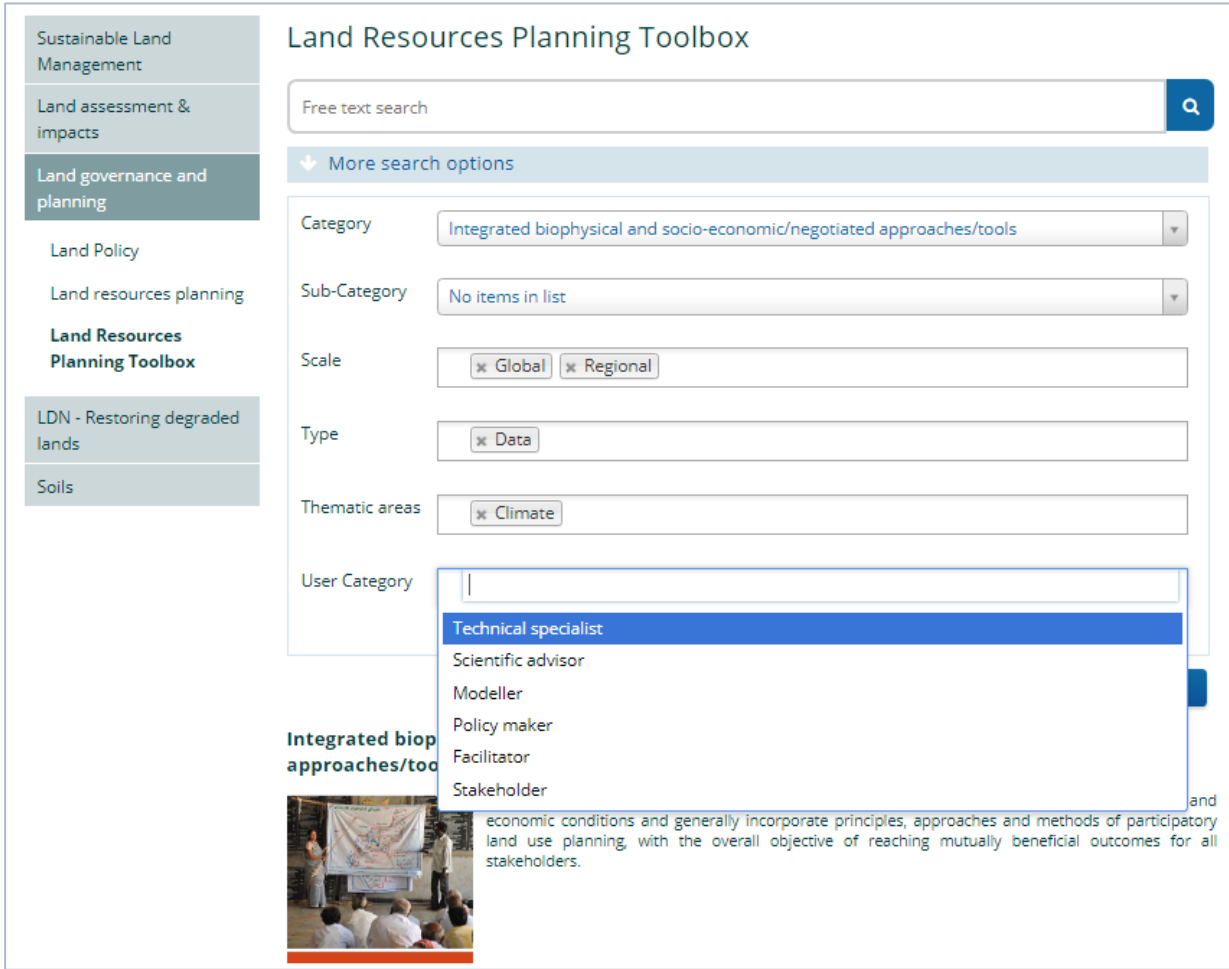
FIGURE 8

**Free search using key words**



The **guided search function** (Figure 9) allows the user to access tools selected through the following filters, which may be individually selected or using combination of the five groups: main category, subcategory, tool type, scale and thematic areas. The filters 'Main category' and 'Sub-category' allow the selection of only one option, the filters 'Scale', 'Type', 'Thematic area' and user category allow the simultaneous selection of several options. As a general recommendation to use the Toolbox, the user can start with broad selection of the search options to explore available tools and gradually narrow down the selection to find the most relevant tool(s). The detailed content of the categories, sub-categories, thematic areas, scale of applicability and, type of tools are listed in Figure 1.

FIGURE 9  
**Guided search function**



**Description of tools:** After scrolling through the retrieved selection, the full description is provided for a specific tool when the user clicks the tool's title (Figure 10). At least one link is provided for direct access to the specific tool or its documentation. Further guidance may be provided through additional links in the main text that allow access to more detailed information on specific topics. The information provided for each tool assist the user to explore the main features of the tool and for which cases the tool can be used, together with further information to download or access the tool and links to provide further information, applications or case studies about the tool. The user can use the tool and the information provided or go back to search again for additional tools.


FIGURE 10

Example of content at record level

## Land & Water

- [Home](#)
- [Overview](#)
- [Water](#)
- [Land](#)
- [Databases & Software](#)
- [News](#)
- [Events](#)
- [Outreach](#)

### Guidelines for Land Use Planning (Guide\_LUP)



The Guidelines for Land Use Planning, published in 1993, summarize experiences gained by FAO on land use planning through numerous field projects and the consensus reached through expert consultations. In the guidelines land use planning is interpreted as the systematic assessment of physical, social and economic factors in such a way as to assist land users with the selection of land use options that increase their productivity, are sustainable and meet the needs of society. Given these comprehensive ambitions, land use planning is an extremely complex subject. The guidelines describe the nature and purpose of land use planning: what it is, why it is needed, who benefits from it, at what scales is planning carried out, by which people. They outline a 10-step logical sequence of activities, from the first meeting between planners and potential users to the implementation of the land use plan. The guidelines also include some of the technical methods available (at the time) for planning, some of which may require additions and updating. The guidelines are primarily intended for people engaged in preparing land use plans as well as administrators and decision-makers in developing countries. The key messages of the guidelines are: (i) good land use planning is fundamentally a learning process, (ii) it can best be learned by doing, (iii) it is not top-down but should involve the active participation of all land users, (iv) each planning situation is unique, therefore instruction manuals are unfeasible.

**Source (link)**  
<https://www.mpl.ird.fr/crea/taller-colombia/FAO/AGLL/pdfdocs/guidelup.pdf>

**Scale**  
 National, Sub-national/Province/District, Locality/Farm/Site, Watershed/Basin/Landscape

**Type**  
 Framework/Guidelines

**Applicability**  
 National, Sub-national/ Province/ District, Locality/ Farm/ Site, Watershed/Basin/Landscape

**Category**  
 Integrated biophysical and socio-economic/negotiated approaches/tools

**Sub-Category**  
 Territorial development/sustainable land management

**Thematic areas**  
 Land management/planning

Sustainable Land Management

Land assessment & impacts

Land governance and planning

Land Policy

Land resources planning

**Land Resources Planning Toolbox**

LDN - Restoring degraded lands

Soils

Acknowledgement: This users' guide and LRP Toolbox were developed with joint efforts from Theodora Fetsi, Eddy De Pauw, James Morgan, Roberta Nettuno and Feras Ziadat.